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NOTICE OF ALLOWANCE AND FEE(S) DUE

22879　　　　7590　　　　08/24/2010

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
3404 E. Harmony Road
Mail Stop 35
FORT COLLINS, CO 80528

EXAMINER
ROBINSON BOYCE, AKIBA K

ART UNIT	PAPER NUMBER
3628	

DATE MAILED: 08/24/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,311	12/15/1999	QIMENG CHEN	10991149-1	7356

TITLE OF INVENTION: CUSTOMER PROFILING APPARATUS FOR CONDUCTING CUSTOMER BEHAVIOR PATTERN ANALYSIS, AND METHOD FOR COMPARING CUSTOMER BEHAVIOR PATTERNS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	11/24/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: <u>Mail</u> **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22879   7590   08/24/2010

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,311	12/15/1999	QIMENG CHEN	10991149-1	7356

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nonprovisional	NO	$1510	$300	$0	$1810	11/24/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ROBINSON BOYCE, AKIBA K	3628	705-010000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered patent attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE   (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.   OMB 0651-0033   U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,311	12/15/1999	QIMENG CHEN	10991149-1	7356

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EXAMINER
ROBINSON BOYCE, AKIBA K

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DATE MAILED: 08/24/2010

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1951 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1951 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

	Application No.	Applicant(s)
Notice of Allowability	09/464,311	CHEN ET AL.
	Examiner	Art Unit
	AKIBA K. ROBINSON BOYCE	3628

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address*--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to <u>communications filed 4/7/10</u>.

2. ☒ The allowed claim(s) is/are <u>1,3,4,6,7,9-11,16-22 and 25-32</u>.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

      a) ☐ All   b) ☐ Some*   c) ☐ None of the:

          1. ☐ Certified copies of the priority documents have been received.

          2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

          3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

     * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413). Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____.

/Akiba K Robinson-Boyce/
Primary Examiner, Art Unit 3628

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Daniel Hu on 8/10/10.

The application has been amended as follows:

Claim 11 is amended as follows:

11. A profiling apparatus, comprising:

a data warehouse for storing customer records including telephone

call data;

a profiling engine <u>having a processor and</u> configured to communicate with the data

warehouse and operative to generate customer telephone calling behavior profiles from

the customer records within the data warehouse, the profiling

engine being configured to define customer telephone calling behavior profiles

using probability distributions, and to compute the customer telephone calling

behavior profiles using OLAP operations on multi-dimensional and multi-level

data cubes, one multi-level data cube being a profile cube, another multi-level

data cube being a profile-snapshot cube, and yet another data cube being a

profile cube formed by merging together the profile cube and the profile-

snapshot cube; and

a computer application program implemented on the profiling

engine and operative to represent behavior profiles as patterns, using the

telephone call data, and derive similarity measures of the patterns usable to

profile customer behavior and detect fraud by deriving calling pattern cubes

from the profile cubes using a probability distribution-based calling pattern,

treating a sub-cube as a bag, and summarizing cell-wise comparison results

based on bag overlap.

        Claim 17 is amended as follows:

17. A method for comparing customer behavior patterns,

comprising:

providing call data in the form of call data records to a data

warehouse;

loading the call data records into a multidimensional database of an

OLAP server;

maintaining profiles by staging data between the data warehouse

and the OLAP multidimensional database;

generating , using a system having a processor, a profile-snapshot cube

accommodating multiple

customers;

in combination with generating the profile-snapshot cube,

generating a profile cube for the same set of customers from the data

warehouse;

updating the profile cube by merging the profile cube with the

profile-snapshot cube;

storing the updated profile cube in the data warehouse; and

deriving similarity measures of patterns usable to profile customer

behavior and detect fraud by deriving calling pattern cubes from the updated

profile cube using a probability distribution-based calling pattern, treating a sub-

cube as a bag, and summarizing cell-wise comparison results based on bag

overlap.

Claim 25 is amended as follows:

25. A profiling apparatus, comprising:

a data warehouse for storing customer records including telephone

call data;

a profiling engine having a processor and configured to communicate with the data

warehouse and operative to generate customer telephone calling behavior profiles from

the customer records within the data warehouse, the profiling engine being configured

to define customer telephone calling behavior profiles using probability distributions, and

to compute the customer telephone calling behavior profiles using OLAP operations on multi-dimensional and multi-level data cubes, one multi-level data cube being a profile cube, another multi-level data cube being a profile-snapshot cube, and yet another data cube being a profile cube formed by merging together the profile cube and the profile-snapshot cube; and

a computer application program implemented on the profiling engine and operative to represent behavior profiles as patterns, using the telephone call data, and derive similarity measures of the patterns usable to profile customer behavior and detect fraud by deriving volume based calling pattern cubes comprising count-cubes from the profile cubes using a probability distribution-based calling pattern, treating a sub-cube as a bag, and summarizing cell-wise comparison results based on bag overlap using cell-to-subcube mapping, the count cubes having non-negative integer cell values, and the bag overlap enables comparison of corresponding sub-cubes of distinct count cubes.

Allowable Subject Matter

2.   Claims 1, 3, 4, 6, 7, 9, 10, 11, 16, 17-22, 25-32 are allowed.

3.   Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office Action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to

resolve any informalities remaining therein before the application is passed to issue.

This will avoid possible delays in the issue process.

4.   The following is an examiner's statement of reasons for allowance. None of the

prior art of record either individually or in combination teach the following:

       -an OnLine Analytical Processing (OLAP) based scalable profiling

engine communicating with the data warehouse and operative to build and

update customer behavior profiles by mining the customer telephone call records

that flow into the data warehouse

       -computing the customer telephone calling behavior profiles using OLAP

operations on multi-dimensional and multi-level data cubes, one multi-level data cube

being a profile cube, another multi-level data cube being a profile-snapshot cube, and

yet another data cube being a profile cube formed by merging together the profile cube

and the profile-snapshot cube

       -maintaining profiles by staging data between the data warehouse

and the OLAP multidimensional database;

       The present invention discloses a customer profiling apparatus for conducting

customer telephone behavior pattern analysis on telephone call records including

telephone call data. The first allowable feature of having an OnLine Analytical

Processing (OLAP) based scalable profiling engine communicating with the data

warehouse and operative to build and update customer behavior profiles by mining the

customer telephone call records that flow into the data warehouse is not disclosed by

any prior art reference. The closest prior art, Murad et al (US 6,526,389) shows a

telecommunications apparatus and method for detecting any unusual activity in

customer behavior, where a comprehensive behavior profile of a customer including a

short-term customer behavior obtained from all of the customer's transactions, and a

long-term customer behavior obtained on the basis of the generated short-term

behavior. In Murad et al, any behavior deviation from the profile is detected and

identified as fraudulent or unusual. The next closest prior art, McDonough et al (US

6,115, 693) discloses a Quality Center for a Virtual Sales and Service Center

responsible for monitoring the "customer experience" across the telephone customer

access resource, and assists in managing the business of operating multiple call

centers as a single Virtual Sales and Service Center. In McDonough et al, the Quality

Center performs analysis 610 on call center statistics in conjunction with Direct Banking

Finance, and make recommendations for improvement, where he statistics to be

analyzed are those that are linked to the most critical performance measurements in the

Performance Measurement DPM. Capabilities for on-line analytical processing (OLAP)

enable quality center executives to gather performance information and analyze trends

and statistics for operational management of the virtual environment.   Newly cited art,

Taniguchi et al discloses an identification of a fraudulent call with a neural network

where the method involves using a statement data record resulting from a call by device

of a neural network for the recognition of a fraud. The next closest newly cited art,

Derks et al discloses using OLAP and datacubes to select a subset of views to be

materialized from a set of views in a telecommunication service. However, Murad et al,

McDonough et al Taniguchi et al, and Derks et al all fail to disclose the feature of an

OnLine Analytical Processing (OLAP) based scalable profiling engine communicating

with the data warehouse and operative to build and update customer behavior profiles

by mining the customer telephone call records that flow into the data warehouse. This

distinct feature has been added to independent claims 1 and 28, and renders them and

all claims that depend from them allowable.

The second allowable feature of computing the customer telephone calling behavior

profiles using OLAP operations on multi-dimensional and multi-level data cubes, one

multi-level data cube being a profile cube, another multi-level data cube being a profile-

snapshot cube, and yet another data cube being a profile cube formed by merging

together the profile cube and the profile-snapshot cube is not disclosed by any prior art

reference. The closest prior art, Murad et al (US 6,526,389) shows a

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with the data warehouse and operative to build and update customer behavior profiles

by mining the customer telephone call records that flow into the data warehouse. This

distinct feature has been added to independent claims 11 and 25, and renders them

and all claims that depend from them allowable.

The third allowable feature of maintaining profiles by staging data between the data

warehouse and the OLAP multidimensional database is not disclosed by any prior art

reference. The closest prior art, Murad et al (US 6,526,389) shows a

telecommunications apparatus and method for detecting any unusual activity in

customer behavior, where a comprehensive behavior profile of a customer including a

short-term customer behavior obtained from all of the customer's transactions, and a

long-term customer behavior obtained on the basis of the generated short-term

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OnLine Analytical Processing (OLAP) based scalable profiling engine communicating

with the data warehouse and operative to build and update customer behavior profiles

by mining the customer telephone call records that flow into the data warehouse. This

distinct feature has been added to independent claim 17, and renders it and all claims

that depend from it allowable.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Akiba K Robinson-Boyce whose telephone number is

571-272-6734. The examiner can normally be reached on Monday-Friday 9am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Hayes can be reached on 571-272-6708. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

•Patent Application Information Retrieval (PAIR) system, Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

A. R. B.
August 17, 2010

/Akiba K Robinson-Boyce/
Primary Examiner, Art Unit 3628